Usefulness of Fournier’s gangrene severity index: a comparative study

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ABSTRACT

Objective: To demonstrate the usefulness of Fournier’s Gangrene Severity Index (FGSI) with mortality predictive value at the Lic. Adolfo López Mateos Regional Hospital.

Materials and methods: A retrospective study of case records from the years 2003-2008 of all patients identified with Fournier’s gangrene (FG) at the authors’ hospital was carried out. The list of patients diagnosed with FG was obtained from the hospital registers. FG was clinically diagnosed based on medical history and physical examination. Perianal, periurethral and scrotal abscesses were excluded from the analysis if there was no evidence of extension to soft tissues or necrosis. To calculate FGSI, 9 hospital admission parameters were evaluated: temperature, heart rate, respiratory rate, sodium, potassium, serum creatinine, serum bicarbonate, leukocyte count and hematocrit. Deviation from the norm was gauged from 0-4 as described by Laor et al. All statistical analysis was developed using SPSS 15 software.

Results: Four of the 33 evaluated male patients (mean age 65 years) died, representing 12.2% of the total. Those 4 patients had an FGSI score above 9 with a mean 13.5.

Conclusions: Fournier’s Gangrene Severity Index is simple and objective. The threshold of 9 is sensitive and specific as a mortality predictor in this type of population.

RESUMEN

Objetivo: Demostrar la utilidad del índice de gravedad para gangrena de Fournier, con valor predictivo de mortalidad, para la aplicación del mismo en el Hospital Regional Lic. Adolfo López Mateos.

Material y métodos: Estudio retrospectivo de expedientes de todos los pacientes identificados con gangrena de Fournier (GF) en este hospital desde 2003 a 2008. La lista de pacientes se obtuvo de los censos de hospitalización con diagnóstico de GF. El diagnóstico de GF fue establecido con criterio clínico basado en la anamnesis y la exploración física. Los abscesos perianales, periuretrales y escrotales se excluyeron del análisis si no hubo evidencia de extensión a tejidos blandos o necrosis. Para calcular el ISGF se evaluaron nueve parámetros de admisión hospitalaria (temperatura, frecuencia cardíaca, frecuencia respiratoria, sodio, potasio, creatinina sérica, bicarbonato sérico, cuenta de leucocitos y hematocrito). La desviación de lo normal se graduó de 0 a 4 como lo describen Laor et al. Todo el análisis estadístico se desarrolló con el software estadístico SPSS 15.

Resultados: De los 33 pacientes evaluados (edad promedio de 65 años), todos del sexo masculino, murieron cuatro, que representaron 12.2%, quienes presentaron una puntuación superior a 9, con una media de 13.5.
Key words: Fournier’s gangrene, index, mortality, predictive value.

Conclusiones: El índice de gravedad en la gangrena de Fournier es simple y objetivo. El umbral de 9 es sensible y específico como predictor de mortalidad en este tipo de población.

Palabras clave: gangrena de Fournier, índice, mortalidad, valor predictivo, México.

INTRODUCTION
Fournier’s gangrene (FG) is an uncommon and potentially lethal disease first described by Baurienne in 1764 and then by A.L. Fournier en 1883 as a gangrenous process of unknown origin. It has been known as idiopathic gangrene, gangrenous erysipelas, and streptococcal gangrene of the scrotum.

It is a progressive infection of the perineum and genitals that is potentially life-threatening. The major incidence is 1 out of 7500 and has been described in men and women of all ages. Prodrome can vary from a few hours to several days and is characterized by affecting the general health state, by fever, edema, cellulitis and pain in the genital or rectal zone and progresses to areas of necrosis and crepitation accompanied by a characteristic fetid odor. Sepsis is invariably present when disease progresses in the absence of aggressive treatment. Risk factors are alcoholism, diabetes, malnutrition, old age and peripheral vascular disease. FG is characterized by a rapid progression from signs and symptoms of cellulitis to fetid necrotic lesions starting at the fascia and going to the skin. Diagnosis is clinical and requires emergency surgery due to its rapid progression (2 cm per hour) from the genitals to the perineum and then to the abdominal wall. Despite aggressive management FG has a mortality rate from 16 - 40 %. Laor et al. developed the Fourniere’s Gangrene Severity Index (FGSI) to stratify risk in these patients. FGSI is a numerical score obtained from a combination of physiological hospital admission parameters that include temperature, heart rate, respiratory rate, sodium, potassium, creatinine, leukocytes, hematocrit and bicarbonate. They established that an FGSI above 9 is sensitive and specific as a mortality predictor in FG patients.

MATERIALS AND METHODS
STUDY GROUP
Retrospective revision of case records from the years 2003-2008 of patients identified as having Fourniere’s Gangrene (FG) was carried out. FG diagnosis was clinically established based on medical history and physical examination. Perianal, periurethral and scrotal abscesses were excluded from the analysis if there was no evidence of extension to soft tissue or necrosis. A total of 33 patients diagnosed with FG were included. FGSI was calculated by evaluating nine hospital admission parameters: temperature, heart rate, respiratory rate, sodium, potassium, creatinine and serum bicarbonate, leukocyte count, hematocrit and bicarbonate. Evaluation criteria were gauged from 0 to +4 as described by Loar et al. in Table 1. Clinical parameter differences were compared between survivors and non-survivors and SPSS 15 software was used for information analysis. Central tendency measures, means and percentages were used.

Inclusion criteria: Patients diagnosed with FG.
Exclusion criteria: Patients with perianal, periurethral and scrotal abscesses were excluded from the analysis if there was no evidence of extension to soft tissue or necrosis.
RESULTS
Of the 33 patients evaluated (mean age 65 years) all were men. Four of them died, representing 12.2 %. The analyzed variables included diabetes mellitus (19 patients 57%), high blood pressure (15 patients 45%), kidney failure (3 patients 9.1%), prodromes (mean 6.5 days), origin (84.8% genitourinary, 15.2% proctological) and microorganisms (E. coli in 100% of cases). Physiological parameters were bicarbonate (15.04 ± 1.62), creatinine (2.33 ± 1.46), heart rate (85.09 ± 7.07), respiratory rate (21.15 ± 2.43), hematocrit (37.38 ± 6.88), leukocytes (13.36 ± 3.37), potassium (4.39 ± 0.89), sodium (134.42 ± 6.46) and temperature (37.6 ± 3.5) (Table 2).

Results were analyzed with binary logistical regression using SPSS software. Odds Ratio (OR) was 7.250 with 95% Confidence Interval (CI).

DISCUSSION
Fournier’s gangrene (FG), first described as rapidly progressing idiopathic infection, includes any necrotizing infection of the external genitals and perineum in both men and women. It is usually a polymicrobial infection whose probable physiopathology is due to endarteritis obliterans of the small and superficial veins, resulting in gangrene.11

Despite aggressive wide-spectrum antibiotic treatment, aggressive surgical debridement, intensive care and anestesia the mortality rates are as high as 43% in some series.5

Anaerobic and aerobic organisms that have been isolated from the most common wounds are: Escherichia coli, Bacteroides spp., Streptococcus spp., Enterococcus spp., and Staphylococcus.3,12 In the present series E. coli was the predominant bacterium.

There is no consensus on clinical variables for predicting FG results. Lower limb and abdominal wall involvement are associated with high mortality rate. Studies have shown that aggressive therapy, age, comorbidities and time of presentation do not affect prognosis.
CONCLUSIONS

FG is an infectious process that can lead to death in up to 40% of patients. Surgical advances and postoperative management have undoubtedly improved mortality rates. Understanding the physiopathology and predisposing factors is essential for early diagnosis and treatment.

There is currently no consensus on the use of indices for predicting mortality. But if there has been lower limb or abdominal wall involvement there is a noticeable increase in mortality rate. FGSI is a useful FG mortality predictor. It was developed in order to aid physicians in predicting mortality probability.

Laor et al. reported that a severity index above 9 indicates a 75% mortality probability while under 9 indicates a 78% survival probability. The present series had a 12.12% mortality rate.

BIBLIOGRAPHY